PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A3-160PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US 03/09009	International filing date *(day/month/year)* 26.03.2003	Priority date *(day/month/year)* 26.03.2002
International Patent Classification (IPC) or both national classification and IPC H01R13/658		
Applicant MOLEX INCORPORATED		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24.09.2003	23.06.2004
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Salojärvi, K Telephone No. +31 70 340-4036

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US 03/09009

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-13 as originally filed

Claims, Numbers

1-7 filed with telefax on 02.06.2004

Drawings, Sheets

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-7
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-7
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-7
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1: US-5368505-A

D2: US-B-6 238 2411

2 The document **D1** is regarded as being the closest prior art to the subject-matter of claim 1.

2.1 Document D1 shows (the references in parentheses applying to this document):

An assembly of cable connectors, comprising:

- at least two cable connectors each of the connectors including a cable holder (52) for holding at least one cable in a preselected regular position, the cable (4) including a plurality of conductors (6), conductive terminal nodes respectively connected to conductors extending out of said cable and extending out of the cable holder,
- an insulative housing (63) that holds said cable holder and terminals, the housing including a mating face for mating with an opposing mating connector,
- a conductive grounding shell (2a, 2b) covering upper and lower surfaces of said housing; and
- stacking means (see Fig. 4) for stacking the two cable connectors together as a unit of connectors, the stacking means including stacking protuberances protruding outwardly from opposite sides of said connector housings;
- a pair of wings extending from said conductive grounding shell (see Fig. 5) in lateral directions along at least two of said protuberances; and
- at least one clamping member (part of the housing, see Fig. 4) engaging said two connector housings and holding them together as a unit of connectors, the clamping member including a body portion having a height equal to a height of said two connector housings, the clamping member body portion including pair of spaced-apart horizontal clamping grooves, each of the clamping grooves receiving at least one stacking protuberance and one grounding shell wing therein from different connector housings.

2.2 The subject-matter of claim 1 differs from this known assembly in that each of the conductive grounding shells includes an upper shell plate and a lower shell plate which are mechanically and electrically connected together at the front side of each connector by at least one integral bridge so as to provide an electrical shield that substantially surrounds the housing of each of the cable connectors.

2.3 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

3 The problem to be solved by the present invention may be regarded as how to provide a complete and integral shielding around the individual connectors.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
There is no hint to this solution in the prior art. D2 discloses shielding also on the front side of the connector housing but the front shield is not integral with the other shielding portions and therefore the manufacture and mounting of the shielding structure is more complicated.

4 Claims 2-7 are dependent on claim 1 and as such also meets the requirements of the PCT with respect to novelty and inventive step.

5 The invention relates to an assembly of cable connectors and consequently it is obvious that the invention has industrial applicablility.

What Is Claimed Is:

1. An assembly of cable connectors, comprising: (86)

at least two cable connectors each of the connectors including a cable holder (100) for holding at least one cable (12) in a preselected regular position, the cable (12) including a plurality of conductors (12a), conductive terminals nodes (112, 114) respectively connected to conductors (12a) extending out of said cable (12) and extending out of the cable holder, and insulative housing (210, 250) that holds said cable holder (100) and terminals (112, 114), the housing (210, 250) including a mating face for mating with an opposing mating connector, a conductive grounding shell (310, 320, 330) covering upper and lower surfaces of said housing (210, 250); and,

stacking means for stacking the two cable connectors together as a unit of connectors, the stacking means including stacking protuberances (406, 408, 412) protruding outwardly from opposite sides of said connector housings;

a pair of wings (414a) extending from said conductive grounding shell (310, 320, 330) in lateral directions along at least two of said protuberances (408, 412); and,

at least one clamping member (400) engaging said two connector housings and holding them together as a unit of connectors, the clamping member (400) including a body portion having a height equal to a height of said two connector housings, the clamping member body portion including pair of spaced-apart horizontal clamping groove (410), each of the clamping grooves receiving at least one stacking protuberance and one grounding shell wing therein from different connector housings, characterized in that:

each of the conductive grounding shells (310, 320, 330) includes an upper shell plate (310) and a lower shell plate (330) which are mechanically and electrically connected together at the front side of each connector by at least one integral bridge (330) so as to provide an electrical shield that substantially surrounds the housing (210, 250) of each of the cable connectors.

2. A connector assembly as claimed in claim 1, wherein the stacking means further includes a plurality of first (406) and third (408) stacking protuberances disposed on opposite sides of each of said connector housings (210, 250) and flanking second stacking protuberances (412), and said clamping member includes a plurality of clamp grooves

(86)

(410), the holding protuberances (406, 408, 412) being received within the clamp grooves (410), each of said clamp grooves (410) having a configuration corresponding to the configuration of said holding protuberances.

3. A connector assembly as claimed in claim 1, wherein said clamping member (400) includes at least one separation surface (402) disposed on each of said clamping member body portions and interposed between adjacent clamping grooves (410) thereof, the separation surface (402) providing a means by which said clamping member (400) may be divided into sub-clamping members.

4. A connector assembly as claimed in claim 1, wherein said clamping member (400) is made from a synthetic resin.

5. A connector assembly as claimed in claim 1, wherein said grounding shell (310, 320, 330) includes distinct upper and lower grounding arms (312, 322) and said grounding shell wings (414a, 414b) extend outwardly from opposite sides of each of said upper and lower grounding plates(310, 320) proximate to said stacking protuberances (406, 408, 412).

6. A connector assembly as claimed in claim 5, wherein said grounding shell wings (414a) of said upper grounding plate (310) are aligned with said grounding shell wings (414b) of said lower grounding plate (320).

7. A connector assembly as claimed in any of claims 1, 5 or 7, wherein said grounding shell arms (312, 322) have an L-shaped configuration.

AMENDED CLAIMS
[received by the International Bureau on 29 August 2003 (29.08.03)
original claims 1-7 replaced by amended claims 1-7]

What Is Claimed Is:

1. An assembly of cable connectors, comprising:

at least two cable connectors each of the connectors including a cable holder (100) for holding at least one cable (12) in a preselected regular position, the cable (12) including a plurality of conductors (12a), conductive terminals nodes (112, 114) respectively connected to conductors (12a) extending out of said cable (12) and extending out of the cable holder, and insulative housing (210, 250) that holds said cable holder (100) and terminals (112, 114), the housing (210, 250) including a mating face for mating with an opposing mating connector, a conductive grounding shell (310, 320, 330) covering upper and lower surfaces of said housing (210, 250); and,

stacking means for stacking the two cable connectors together as a unit of connectors, the stacking means including stacking protuberances (406, 408, 412) protruding outwardly from opposite sides of said connector housings;

a pair of wings (414a) extending from said conductive grounding shell (310, 320, 330) in lateral directions along at least two of said protuberances (408, 412); and,

at least one clamping member (400) engaging said two connector housings and holding them together as a unit of connectors, the clamping member (400) including a body portion having a height equal to a height of said two connector housings, the clamping member body portion including pair of spaced-apart horizontal clamping groove (410), each of the clamping grooves receiving at least one stacking protuberance and one grounding shell wing therein from different connector housings, characterized in that:

the conductive grounding shell (310, 320, 330) having an upper shell plate (310) and a lower shell plate (330) which are mechanically and electrically coupled by at least one conductive connection bridge (330) so as to provide an electrical shield that substantially surrounds the housing (210, 250).

2. A connector assembly as claimed in claim 1, wherein the stacking means further includes a plurality of first (406) and third (408) stacking protuberances disposed on opposite sides of each of said connector housings (210, 250) and flanking second stacking protuberances (412), and said clamping member includes a plurality of clamp grooves (410), the holding protuberances (406, 408, 412) being received within the clamp

REPLACED BY ART 34 AMDT

grooves (410), each of said clamp grooves (410) having a configuration corresponding to the configuration of said holding protuberances.

3. A connector assembly as claimed in claim 1, wherein said clamping member (400) includes at least one separation surface (402) disposed on each of said clamping member body portions and interposed between adjacent clamping grooves (410) thereof, the separation surface (402) providing a means by which said clamping member (400) may be divided into sub-clamping members.

4. A connector assembly as claimed in claim 1, wherein said clamping member (400) is made from a synthetic resin.

5. A connector assembly as claimed in claim 1, wherein said grounding shell (310, 320, 330) includes distinct upper and lower grounding arms (312, 322) and said grounding shell wings (414a, 414b) extend outwardly from opposite sides of each of said upper and lower grounding plates(310, 320) proximate to said stacking protuberances (406, 408, 412).

6. A connector assembly as claimed in claim 5, wherein said grounding shell wings (414a) of said upper grounding plate (310) are aligned with said grounding shell wings (414b) of said lower grounding plate (320).

7. A connector assembly as claimed in any of claims 1, 5 or 7, wherein said grounding shell arms (312, 322) have an L-shaped configuration.